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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/812,602

03/30/2004

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EXAMINER

SLOMSKI, REBECCA

ART UNIT

PAPER NUMBER

2877

MAIL DATE

DELIVERY MODE

09/13/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/812,602

**Applicant(s)**

NOHDO, SHINICHIRO

**Examiner**

Rebecca C. Slomski

**Art Unit**

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/23/07</u> . | 6) <input type="checkbox"/> Other: _____  |

DETAILED ACTION

*Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended limitation of "a third interval between adjacent dot pattern groups, the third interval being wider than an interval between the dot patterns" (lines 11-12 of claim 1, lines 11-12 of claim 6, lines 14-15 of claim 9, and lines 12-13 of claim 15) has not been previously disclosed.

*Claim Rejections - 35 USC § 102*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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Claims 1 – 10, 12-16, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyatake (U. S. Patent # 6,046,508).

2. With respect to claims 1 and 6, Miyatake discloses position detecting marks comprising:

- Alignment marks on an exposure surface, the alignment marks having edges for scattering inspection light for alignment during an exposure (Col.4, L 27-34)
- The alignment mark is configured to have a plurality of dot pattern groups, each of the dot pattern groups being projections from the exposure surface and configured to have a plurality of dot patterns arrayed in a predetermined direction (Col.4, L 22-23, Figure 2C, 13A)
- The plurality of dot pattern groups are arrayed in the predetermined direction with an interval between the dot patterns groups, the interval being wider than an interval between the dot patterns (Figure 2C, 13A, y1)
- The plurality of dot pattern groups are arrayed in a second predetermined direction perpendicular to the first predetermined direction with a third interval between adjacent dot pattern groups, the third interval being wider than an interval between the dot patterns (Figure 2C, 14A, x1)

3. With respect to claim 9, Miyatake discloses a position detecting method comprising:

- Radiating inspection light for alignment to a surface of wafer in such a way that the inspection light is incident on an alignment mark in a surface of the

wafer and scattered therein before exposure with an exposure mask (Col.2, L 8-21)

- Wherein the exposure mask has alignment marks, the alignment marks being configured to have a plurality of dot pattern groups, each of the dot pattern groups being configured to have a plurality of dot patterns arrayed in a predetermined direction, and the plurality of dot pattern groups being arrayed in the predetermined direction with an interval between the dot pattern groups, the interval being wider than an interval between the dot patterns (Col.4, L 22-23, Figure 2C)
- The alignment mark of the wafer has a same pattern as that of the dot pattern of the exposure mask (Figure 2A, Col.5, L 51-53)
- The plurality of dot pattern groups are arrayed in a second predetermined direction perpendicular to the first predetermined direction with a third interval between adjacent dot pattern groups, the third interval being wider than an interval between the dot patterns (Figure 2C, 14A, x1)

4. With respect to claim 15, Miyatake discloses a position detecting method comprising:

- Performing an alignment by causing scattering of inspection light for alignment at an alignment mark on a surface of an exposure mask (Abstract)
- Performing an exposure of a wafer via the exposure mask (Abstract)

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- Wherein the exposure mask is configured to have alignment marks, the alignment marks being configured to have a plurality of dot pattern groups, each of the dot pattern groups being configured to have a plurality of dot patterns arrayed in a predetermined direction, and the plurality of dot pattern groups being arrayed in the predetermined direction with an interval between the dot pattern groups, the interval being wider than an interval between the dot patterns (Col.4, L 22-23, Figure 2C)
  - The plurality of dot pattern groups are arrayed in a second predetermined direction perpendicular to the first predetermined direction with a third interval between adjacent dot pattern groups, the third interval being wider than an interval between the dot patterns (Figure 2C, 14A, x1)
5. With respect to claims 2, 12 and 18, Miyatake discloses all of the limitations as applied to claims 1, 9 and 15 above. In addition, Miyatake discloses:
- Dot pattern is formed by performing a proximity exposure (Col.1, L 15-16)
6. With respect to claim 3, Miyatake discloses all of the limitations as applied to claim 1 above. In addition, Miyatake discloses:
- Dot pattern is a raised rectangular pattern (Col.5, L 45-47)
7. With respect to claims 4 and 7, Miyatake discloses all of the limitations as applied to claims 1 and 6 above. In addition, Miyatake discloses:

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8. With respect to claims 5 and 8, Miyatake discloses all of the limitations as applied to claims 1 and 6 above. In addition, Miyatake discloses:

- Alignment marks are disposed at a plurality of portions in respective directions (Figure 2C)

9. With respect to claims 10 and 16, Miyatake discloses all of the limitations as applied to claims 9 and 15 above. In addition, Miyatake discloses:

- The inspection light for alignment is incident on the exposure mask and the wafer in an oblique direction (Col.4, L 27, Figure 1)

10. With respect to claims 13 and 19, Miyatake discloses all of the limitations as applied to claims 9 and 15 above. In addition, Miyatake discloses:

- The detecting of scattered inspection light is performed by differentiation processing of a signal strength along the arrangement direction of dot patterns (Col.9, L 24-37)

11. With respect to claim 14 and 20, Miyatake discloses all of the limitations as applied to claims 9 and 15 above. In addition, Miyatake discloses:

- Peaks of higher signal strength with stronger scattering of the inspection light are arranged periodically in the direction of arrayed dot pattern (Col.12, L 50-61)

*Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyatake U. S. Patent # 6,046,508 in view of Schulz U.S. Publication 2003/0044702.

12. With respect to claims 11 and 17, Miyatake discloses all of the limitations as applied to claims 9, 10, 15 and 16 above. However, Miyatake fails to disclose the inspection light is radiated onto the exposure surface in such a way that the plane of incidence of the inspection light is parallel to the arrangement direction of the dot pattern.

Schulz discloses semiconductor measuring device comprising:

- Inspection light is radiated onto the exposure surface in such a way that the plane of incidence of the inspection light is parallel to the arrangement direction of the dot pattern (P.0030)

It would have been obvious to one of ordinary skill in the art at the time the invention was conceived to use the parallel incident light of Schulz in the position detecting method of Miyatake since it would increase sensitivity along that direction. (Schulz, P.0030)

*Response to Arguments*

The following is in response to the arguments presented by the applicant in the response to the April 24, 2007 Office Action.



13. Applicant's arguments, see Page 9, with respect to the rejection(s) of claim(s) 1, and 3-8 under 35 U.S.C. 102 anticipated by Tominaga, have been fully considered and in view of the amendment are persuasive. The rejection has been withdrawn.

14. Applicant's arguments, see Page 7, with respect to the rejection of claims 1-10, 12-16, and 18-20 under Miyatake have been fully considered but are not persuasive. The rejection, with the addition of the amendment, has been maintained.

#### *Citation*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Adel et al. U.S. Patent # 6,921,916 discloses overlay marks in a plurality of groups.

#### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to

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37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

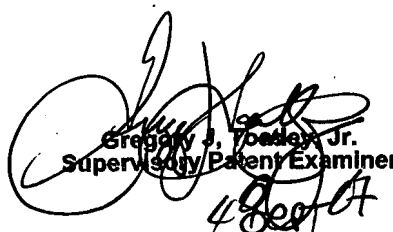
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca C. Slomski whose telephone number is 571-272-9787. The examiner can normally be reached on Monday through Thursday, 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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4/20/07